FACT SHEET FOR NPDES PERMIT WA0020192
TOWN OF PE ELL

9/22/2003

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	Town of Pe Ell
Facility Name and Address	Pe Ell Wastewater Treatment Plant Main Street Pe Ell, WA 98572
Type of Treatment:	Municipal Secondary Treatment--Oxidation Ditch, UV disinfection
Discharge Location	Chehalis River Latitude: 46º 34' 48" N Longitude: 123º 17' 56" W.
Water Body ID Number	WA-23-1100, 1238225469619

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The Town of Pe Ell's wastewater treatment system is being reconstructed at the writing of this permit. The permit and fact sheet are written for the new Pe Ell wastewater treatment system which should be on-line at approximately the same time this permit is completed. The previous treatment system, built in 1971, consisted of an oxidation ditch and undersized clarifier followed by chlorine disinfection. The Town of Pe Ell has a population of about 660. The original system was under designed and has had problems meeting permit limits because of infiltration and inflow overloading the system.

In 1994 a total maximum daily loading study (TMDL) study was completed for the upper Chehalis basin. A TMDL study assesses problems with waters not meeting water quality limits. The TMDL establishes waste load allocations to point and non-point pollution sources in order to get the water body back on track to meet limits. The TMDL study found severe dissolved oxygen depression due primarily to nutrient loading at and upstream of Chehalis. A waste load allocation was established for Pe Ell for ammonia-N at 9.69 lbs/day and BOD_5 at 48.5 lbs/day.

COLLECTION SYSTEM STATUS

The Pe Ell collection system has had severe infiltration and inflow (I/I) problems that overload the old treatment works during rain events. EPA screening criteria to identify an I/I problem is:

> Infiltration is excessive when the highest 7-14-day average daily dry weather flow is greater than 120 gallons per capita per day. Inflow is excessive when the highest recorded daily flow during a storm event is greater than 275 gallons per capita per day or when hydraulic overloading of the treatment plant occurs.

The average dry weather flow for Pe Ell was 150 gal per capita per day and the year round value was 749 gal per capita per day. The storm event flows are even higher. These average values are way over the EPA recommended screening criteria and hydraulic overloading of the plant has been occurring.

The 1998 general sewer plan recommended several modifications to the collection system as follows:

- Replace approximately 1,900 feet of mainline sewer pipe that is made of clay.
- Replace nine manholes on the clay sewer line.
- Inspect lines in the collection system that are believed to be damaged using a TV camera.

Most of the work under item number one and two has been completed. However, many side sewers that connect private homes to the mainlines need to be replaced.

TREATMENT PROCESSES

The flow will enter the headworks at a gravity grit channel followed by a Parshall flume with ultrasonic flow measurement. A rotary screen or a manual bar screen will be used to screen the influent. Flow will then enter a selector chamber with aeration which will allow adjustment of the food to mass ratio and aid in achieving the favorable microorganisms for nitrogen removal in the oxidation ditch. The flow then enters the new oxidation ditch which uses a pair of large brush rotors and also has large blade "banana"

mixers to boost aeration and mixing. The operator will be able to create or remove anoxic zones within the oxidation ditch. With the combination of the selector and the new oxidation ditch, the system should be capable of a high rate of removal of both carbonaceous BOD and ammonia related nitrogen. The flow will then be split to enter a pair of new clarifiers used in parallel. After the clarifiers there will be a UV disinfection channel with three banks of UV lamps followed by an effluent Parshall flume with flow monitoring and finally the flow will be pumped and discharged to the Chehalis River.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility via a 12-inch single port outfall into the Chehalis River. The outfall is located due west of the plant and will be located approximately 22-feet from the bank at low flow. This places the outfall approximately in the middle of the river during low flow. The end of the outfall will be equipped with a "Tide Flex" valve, which is a flexible rubber nozzle that requires the effluent to discharge to the port under force. Therefore the effluent must be discharged at a constant pressure which will aid in the mixing of the effluent.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the secondary clarifiers, as biosolids, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, and screenings are drained and disposed of as solid waste at the local solid waste transfer station. Scum and other solids removed from the clarifiers are thickened in aerobic digesters and dried in drying beds. These resulting biosolids [sludge] may then be managed only as allowed under the Biosolids General Permit which is administered by the Department's Solid Waste Program. The Permittee will need to apply for this permit coverage separately from the NPDES Wastewater permit.

The old clarifier will be turned into an aerobic digester and the old oxidation ditch will be turned into an aerobic digester and sludge storage. New sludge drying beds with more surface area will replace the old ones.

PERMIT STATUS

The previous permit for this facility was issued on March 30, 1995, and modified on September 30, 1998. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and Total Residual Chlorine.

An application for permit renewal was submitted to the Department in February 2000, and was not accepted by the Department. However, the main problems with the previous application related to operation and violation of permit limits which applied to the old facility. Because the facility is being replaced and the Department engineers have reviewed and accepted plans for the new facility, and the General Sewer Plan and amendments, the problems with the application will not effect the new plant. The application is now accepted.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received several inspections related to the construction of the new facility and making sure the new facility construction is in compliance with the loan agreements for the facility administered by the Department. The last formal inspection of the old facility was conducted on September 18, 2002. This inspection found the old facility in fairly good working order. Over the last several years, however, the engineering staff at the Department has been focused on making sure the new facility will be able to

perform to the standards it was intended. Therefore, the engineering staff has spent many hours reviewing the engineering plans and inspecting the new facility as construction progresses.

Because this fact sheet and permit are focused on the new facility which will replace the old facility, only a short characterization of the old facility will be included in this permit.

During the history of the previous permit, the Permittee has not remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

The proposed permit limits for the new facility are as follows:

	EFFLUENT LIMITATIONS: OUTFALL # 001	
Parameter	**Average Monthly**	**Average Weekly**
Biochemical Oxygen Demand (5 day)	30 mg/L, 23.4 lbs/day 85%	45 mg/L, 35.1 lbs/day
Total Suspended Solids	30 mg/L, 23.4 lbs/day 85%	45 mg/L, 35.1 lbs/day
Fecal Coliform Bacteria	100 col./100 ml	
pH	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Parameter	**Average Monthly**	**Maximum Daily**
Total Ammonia as NH_3-N (May – October)	6.91 mg/L, 6.46 lbs/day	13.9 mg/L, 9.69 lbs/day

WASTEWATER CHARACTERIZATION

Since the last permit was issued there have been 509 violations of effluent parameters which include BOD, TSS, Chlorine Residual, Flow, pH, Fecal Coliform, and Temperature. Because the permit will be concerned only with the new facility, only the influent parameters are characterized below. The new treatment works will have a profound effect in improving the quality of the effluent.

The concentration of pollutants in the influent was reported in the discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

Parameter	Concentration and Loading
BOD_5	98 mg/L
BOD_5	135 lbs/day
TSS	85 mg/L
TSS	107 lbs/day

The influent concentrations may be lower than average for this type of community, which is probably due to the dilution from I/I. These values should become greater with the fixing of I/I problems over the life of the permit.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation**.** Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the General Sewer Plan and Facilities Plan Amendment, 2001 engineering report prepared by Gray and Osborne and are as follows:

Table 2: Design Standards for Pe Ell WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	0.78 MGD
Peak daily flow	2.9 MGD
$CBOD_5$ influent loading	255 lbs/day, 138 mg/L
TSS influent loading	255 lbs/day, 138 mg/L
Ammonia-N	34 lbs/day, 18.5 mg/L
Design population equivalent	1275

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD_5, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 ml Weekly Geometric Mean = 400 organisms/100 ml
BOD_5 (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

Monthly effluent mass loadings (lbs/day) for BOD and TSS were calculated as the maximum monthly design flow (0.78 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 23.4 lbs/day.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 35.1 lbs/day.

The General Sewer Plan and Facility Plan Amendment of 2001 calculated seasonal limits for BOD and TSS, however, it appears that these values may have been in error. The above calculations show that the facility will have no problem meeting the TMDL mandated limit of 48.5 lbs/day when discharging 30 mg/L. The facility will therefore be limited to 35.1 lbs/day.

The facility will have a seasonal limit for ammonia-N which will be discussed under water quality based limits below.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving

water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records under the TMDL and determined ambient water quality conditions. With meeting and exceeding the TMDL requirements, the discharges authorized by this proposed permit should not cause a loss of beneficial uses. The new facility should do a better job of removing pollutants than the old facility.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Chehalis River which is designated as a Class A receiving water in the vicinity of the outfall. There are no other nearby point source outfalls on this portion of the river. The next point source outfall is approximately 30 miles downstream where the Westfarm Foods (formally Darigold) waste treatment outfall and then the City of Chehalis outfall enters. Significant nearby non-point sources of pollutants include multiple small livestock operations and dairies which have been assessed in on-going programs. Characteristic uses of Class A waters include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for Class A water which this facility discharges are summarized below:

Fecal Coliform	100 organisms/100 ml maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

The 1994 TMDL came about as a result of waters not meeting water quality standards, and a fish kill that was caused by low dissolved oxygen (DO). The Chehalis River was assessed and placed on the 303(d) list for waters that do not meet standard. The primary focus of the TMDL, as a result of the 303(d) listing, was temperature, pH, DO, fecal coliform bacteria, and ammonia.

The TMDL found the major cause of non-attainment of temperature was loss of riparian shade. No waste load allocations were set for temperature at Pe Ell. Temperature will, however, need to be monitored in the new permit and is discussed further below.

The main focus of the TMDL was on the DO being depressed in the lower river near Chehalis. The recommendation was to reduce nitrogen and nitrogenous ammonia from all the point sources above the Chehalis reach which includes Pe Ell. Because BOD directly affects the DO in the river, BOD was limited as well.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The mixing zone must meet the most stringent combination of the following:

1. Maximum allowable length = 300 feet downstream; 100 feet upstream;

2. Maximum allowable width = 25% of the river width = 11 feet;

3. Maximum allowable flow = 25%. Based on a low flow of 21.4 cfs this amounts to 5.35 cfs.

An analysis of dilution was found in the General Sewer Plan and Facility Plan (Gibbs & Olson, 1998). This analysis did a thorough job of examining the river profile at low flow, but had an error in calculating velocity. Therefore, an average velocity of 0.21 feet per second was used based on the low flow and a cross section for the river of 102 square feet. A value for effluent flow of 0.184 mgd was used in the new calculation which allowed for future growth. This effluent flow value represents the average flow during the dry season plus 50 percent.

A first dilution analysis used RIVPLUM5 and the above parameters. However, this analysis showed that the mixing would require the entire river flow. WAC 173-201A does not allow more than 25 percent of river flow or width to be used for dilution. Therefore a dilution based on 25 percent of the river flow was used with a simple mixing based on the 7Q10 minimum flow.

21.4 cfs x 25% = 5.35 cfs. (This is the maximum river flow allowed for dilution.)

Chronic dilution factor = $(Q_{discharge} + Q_{upstream})/ Q_{discharge}$ = (0.29 cfs + 5.35 cfs)/0.29 cfs =19.4

Acute dilution Factor is limited to 2.5% of flow which is 10 percent of the chronic flow = (0.29 cfs + 0.535 cfs)/0.29 cfs = 2.85.

The dilution factors of effluent to receiving water that occur within these zones have been determined by simple mixing at the critical condition. The dilution factors have been determined to be:

	Acute	Chronic
Aquatic Life	2.85	19.4

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Chehalis River is the seven day average low river flow with a recurrence interval of ten years (7Q10). The TMDL study which considered both historical data and an intensive monitoring study conducted in July to October 1991 and May to September 1992. Ambient background data at critical conditions in the vicinity of the Pe Ell outfall was taken from the Department of Ecology Environmental Assessment Data Base of ambient monitoring. The station used was for the Chehalis River near Dryad may be found at http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html. The data shown in the following critical conditions table includes data from 1997 to 2002 for the dry season from May through October which were calculated at the 90th and 10th percentiles.

Parameter	Value used
7Q10 low flow	21.4 cfs
Velocity	0.21 ft/sec
Depth	2.3 feet
Width	44 feet
Slope	0.007
Temperature	19.6^{o} C
Dissolved Oxygen (low)	8.64 mg/L
Ammonia-N	0.024 mg/L
pH (high)	8.06 standard units
Fecal Coliform	326/100 ml dry weather
Conductivity	75.5

No metals were shown in ambient monitoring and were treated as though they were below detection.

BOD_5--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD_5 was placed in the permit.

The impact of BOD on the receiving water was modeled using a simple mixing model (IDOD2), at critical condition and with the technology-based effluent limitation for BOD_5 described under "Technology-Based Effluent Limitations" above. The calculations used to determine dissolved oxygen impacts are shown in Appendix C.

The TMDL limit for BOD_5 of 48.5 lbs/day was not exceeded. The facility will be capable of achieving 23.4 lbs/day with the technology based concentration limit of 30mg/L and will be able to achieve 35.1 pounds per day and 45 mg/L as a weekly limit.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables included: dilution factor 19.4, upstream temperature 19.6ºC, upstream pH 8.06, upstream alkalinity 27(as mg $CaCO_3$/L), effluent temperature 20ºC, effluent pH of 7.3, effluent pH of 9, and effluent alkalinity 150 (as mg $CaCO_3$/L).

The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 19.6ºC, which is the 90th percentile from the last five years of data. There has been no long term monitoring of effluent temperature, therefore a typical summer municipal temperature of 20ºC was used. The predicted resultant temperature at the boundary of the chronic mixing zone is 19.62ºC and the incremental rise is 0.02ºC which is ten times less than the allowable 0.2ºC increase.

However, because the ambient temperature is above water quality criterion of 18ºC, there is concern. The TMDL strategy for temperature is to increase riparian shade and was less concerned with point source inputs. Because very little is known about the effluent temperature, especially with a new facility, the Permittee will be required to monitor temperature over the life of the permit. Temperature measurements should be taken daily from the influent, effluent and upstream in the river during the mid-afternoon when temperature is at a maximum during the summer months.

Under critical conditions there is no predicted violation of the Water Quality Standards for pH. Therefore, the technology-based effluent limitations for pH was placed in the permit.

Fecal coliform-- The critical conditions table shows a dry season fecal coliform value of 326 col./100 ml. This value is based on a station at Dryad which is downstream of the Pe Ell treatment works and represents a 90th percentile of five years of summer data. Samples taken under the TMDL at and above Pe Ell appear to be just as high. These high fecal coliform values confirms the 303(d) listing. A technology based limit of 200 col./ml monthly and 400 col./ml weekly will not be allowed.

The permit will be limited to the water quality standard of 100 col./100ml at the end of the pipe. Because the facility will have state of the art UV disinfection, it should have no problem achieving an even better level of disinfection most of the time.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The TMDL requires the ammonia load to the Chehalis River to be no more than 9.69 lbs/day. A limits calculation was done for the ammonia using the TSDCALC spreadsheet and found that a waste load allocation of 13.9 mg/L was needed to meet water quality limits for toxicity (See the Permit Limits Calculation Table in Appendix C). The 9.69 lbs/day is intended to be a daily maximum limit as is the concentration limit of 13.9 mg/L. The limits spreadsheet also calculated an average monthly limit of 6.9 mg/L. Because the weekly loading is usually 1.5 times the monthly load, the average monthly load will be limited to 6.46 lbs/day. A reasonable potential calculation was not used because it relies on performance data which this facility does not have.

The concentration limits are based on toxicity and the loading limits are based on the TMDL WLA which was set to protect downstream dissolved oxygen. Therefore, a straight calculation based on concentration, maximum summer flow, and a standard conversion factor would yield a higher loading limit than is allowed under the TMDL. The maximum summer flow is conservative and not likely to be seen coinciding with other conservative assumptions. The loading limits will therefore likely be the limiting factor most of the time.

These limits will apply in the summer months only (May through October). The TMDL WLA was needed only for summer low flows. During the winter the increased flows and colder water greatly reduce the ammonia toxicity and impacts on dissolved oxygen. The facility should be able to meet 13.9 mg/L and 9.69 lbs/day in the winter without a limit although the permit will require monitoring during the winter.

Therefore ammonia-N limits will be: 13.9 mg/L and 9.69 lbs/day as a daily maximum and 6.91 mg/L and 6.46 lbs/day as the average monthly limits during the summer.

The parameters used in the critical condition modeling are as follows: acute dilution factor 2.85, chronic dilution factor 19.4, receiving water temperature 19.6ºC, receiving water alkalinity 27(as mg $CaCO_3$/L). No other toxic pollutants or metals were monitored under the TMDL, nor were any metals monitored at the existing Pe Ell plant. Because the new plant is not yet operational, no determination has been made for metals. No metals are expected because of the nature of this facility being small municipal with no commercial or industrial inputs.

If metals are sampled in the future, the following considerations should be made:

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for an oxidation ditch facility with average design flow less than 2.0 mgd.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for: General Chemistry and Microbiology which includes BOD/CBOD, total residual chlorine, dissolved oxygen, pH, solids, total suspended, and fecal coliform. Ammonia must be tested in a separate laboratory that is accredited to do ammonia, unless the Pe Ell laboratory becomes accredited to do ammonia.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, Revised Code of Washington (RCW) 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The proposed permit requires submission of a new O&M manual for the new plant and the entire sewage system.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by the Department under Chapter 70.95 RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Lewis County Health Department.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit. This information will by used by the Department to develop or update local limits and is also required under 40 CFR 503.

PRETREATMENT

DUTY TO ENFORCE DISCHARGE PROHIBITIONS

This provision prohibits the Publicly Owned Treatment Works (POTW) from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet..

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

SUPPORT BY THE DEPARTMENT FOR DEVELOPING PARTIAL PRETREATMENT PROGRAM BY POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit Condition S.8 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection once during the permit cycle. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the

beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

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1998. Town of Pe Ell General Sewer Plan and Facilities Plan. #626.13

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1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

1994. Upper Chehalis River Dry Season Total Maximum Daily Load Study. Publication Number 94-126.

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 13, 2002, and July 20, 2002, in the *Chronicle* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on July 19, 2003, in the *Chronicle* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6554, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD5 – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD5 is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued there under (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at (http://www.ecy.wa.gov/programs/wq/wastewater/index.html)

Freshwater un-ionized ammonia criteria

Based on EPA Gold Book (EPA 440/5-86-001) as revised by Heber and Ballentine (1992).

Based on Lotus File NH3FRES2.WK1 Revised 12-Dec-94

INPUT

1. Temperature (deg C; 0<T<30):	19.6
2. pH (6.5<pH<9.0):	8.06
3. Total Ammonia (ug N/L):	24.4
4. Acute TCAP (Salmonids present- 20; absent- 25):	20
5. Chronic TCAP (Salmonids present- 15; absent- 20):	15

OUTPUT

1. Intermediate Calculations:

Acute FT:	1.0280
Chronic FT:	1.4125
FPH:	1.0000
RATIO:	13.5000
pKa:	9.4137
	4.2413
Fraction Of Total Ammonia Present As Un-ionized:	%

2. Sample Un-ionized Ammonia Concentration (ug/L as NH3-N):	1.0

3. Un-ionized Ammonia Criteria:

Acute (1-hour) Un-ionized Ammonia Criterion (ug/L as NH3-N):	207.9
Chronic (4-day) Un-ionized Ammonia Criterion (ug/L as NH3-N):	34.5

4. Total Ammonia Criteria:

Acute Total Ammonia Criterion (ug/L as NH3-N):	4,902
Chronic Total Ammonia Criterion (ug/L as NH3-N):	813

Dissolved oxygen concentration following initial dilution.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Based on Lotus File IDOD2.WK1 Revised 19-Oct-93

INPUT

1. Dilution Factor at Mixing Zone Boundary:	19.4
2. Ambient Dissolved Oxygen Concentration (mg/L):	8.64
3. Effluent Dissolved Oxygen Concentration (mg/L):	4
4. Effluent Immediate Dissolved Oxygen Demand (mg/L):	0

OUTPUT

Dissolved Oxygen at Mixing Zone Boundary (mg/L):	8.40

Calculation of pH of a mixture of two flows.

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT

1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	19.400

1. UPSTREAM/BACKGROUND CHARACTERISTICS

Temperature (deg C):	19.60
pH:	8.06
Alkalinity (mg CaCO3/L):	27.00

2. EFFLUENT CHARACTERISTICS

Temperature (deg C):	20.00
pH:	7.30
Alkalinity (mg CaCO3/L):	150.00

OUTPUT

1. IONIZATION CONSTANTS

Upstream/Background pKa:	6.38
Effluent pKa:	6.38

2. IONIZATION FRACTIONS

Upstream/Background Ionization Fraction:	0.98
Effluent Ionization Fraction:	0.89

3. TOTAL INORGANIC CARBON

Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	27.57
Effluent Total Inorganic Carbon (mg CaCO3/L):	168.12

4. CONDITIONS AT MIXING ZONE BOUNDARY

Temperature (deg C):	19.62
Alkalinity (mg CaCO3/L):	33.34
Total Inorganic Carbon (mg CaCO3/L):	34.82
pKa:	6.38
pH at Mixing Zone Boundary:	7.74

Permit Limit Calculation Summary

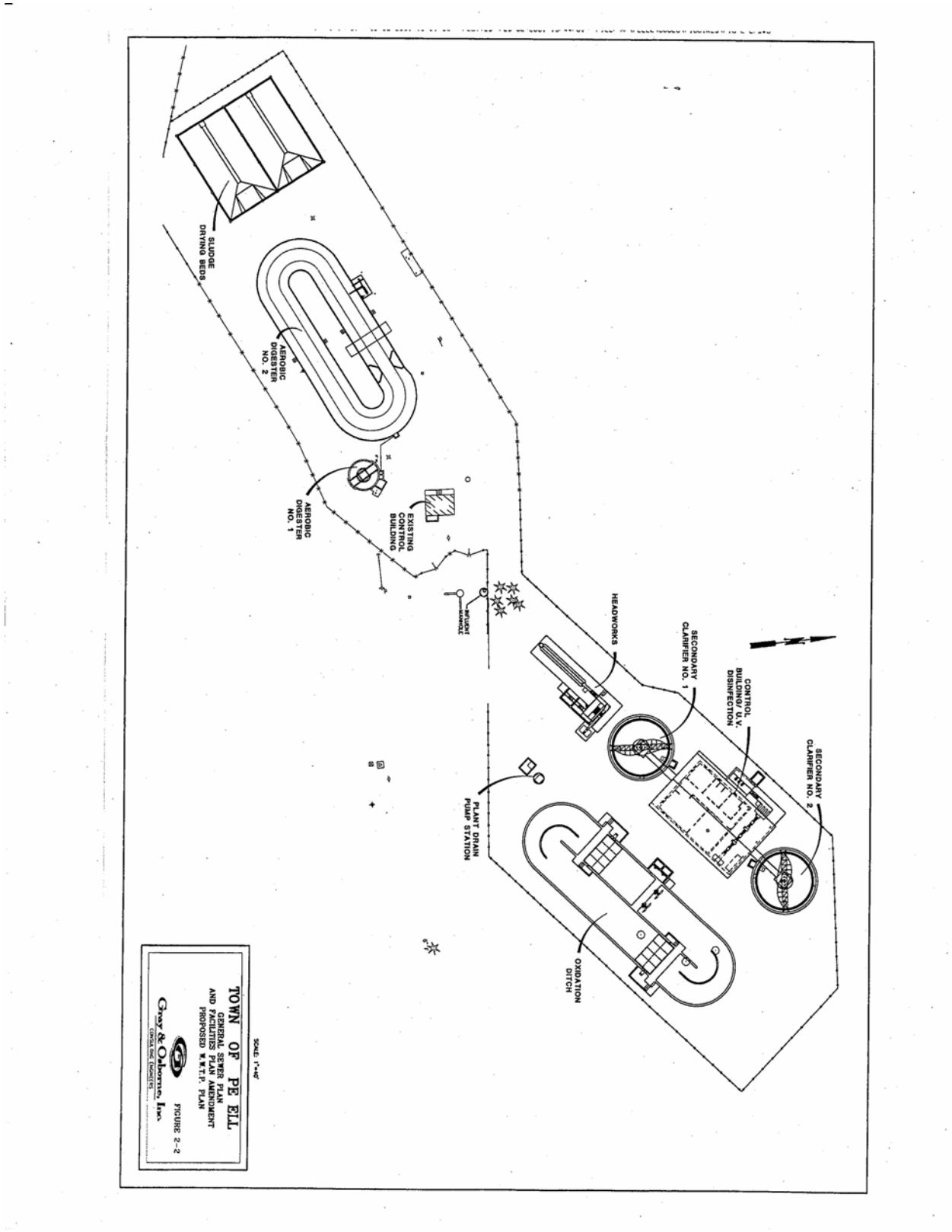
PARAMETER	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator Acute	Metal Criteria Translator Chronic	Ambient Concentration *ug/L*	Water Quality Standard Acute *ug/L*	Water Quality Standard Chronic *ug/L*	Average Monthly Limit (AML) ug/L	Maximum Daily Limit (MDL) ug/L
ammonia	2.9	19.40			24.4000	4902.0000	813.0000	**6941.3**	**13925.6**

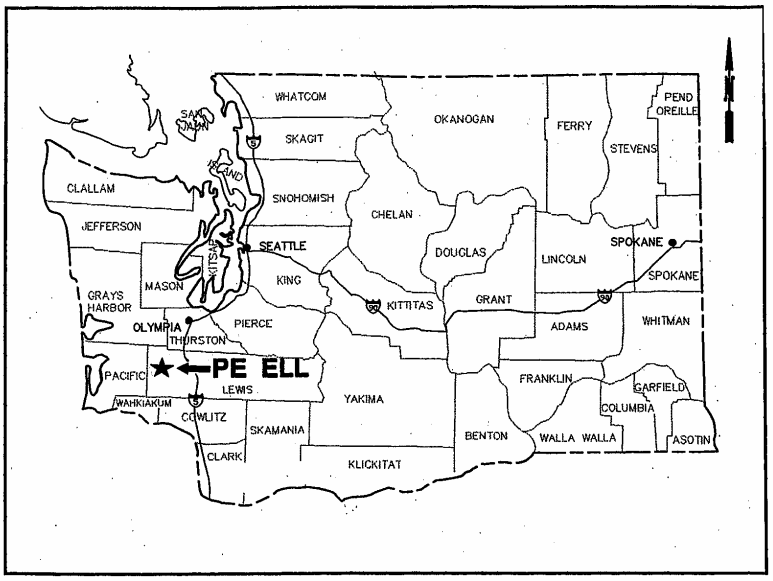
Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations

WLA Acute *ug/L*	WLA Chronic *ug/L*	LTA Acute *ug/L*	LTA Chronic *ug/L*	LTA Coeff. Var. (CV) *decimal*	LTA Prob'y Basis *decimal*	Limiting LTA *ug/L*
13926	15323.24	4471.3	8082.0	0.60	0.99	4471.3

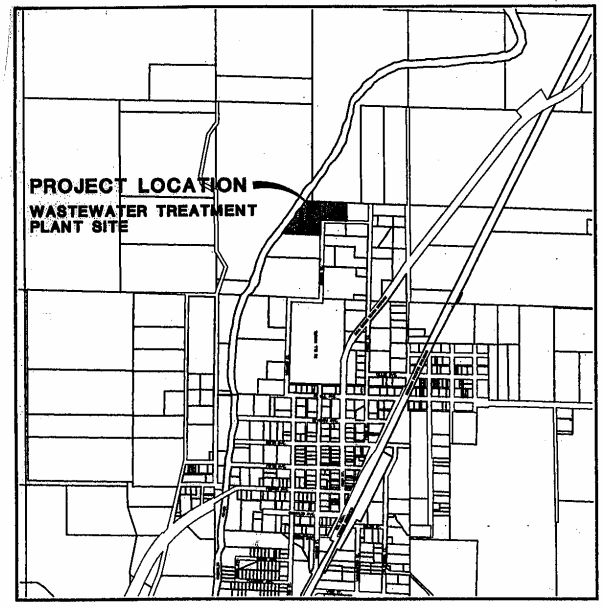
Statistical variables for permit limit calculation

Coeff. Var. (CV) *decimal*	AML Prob'y Basis *decimal*	MDL Prob'y Basis *decimal*	# of Samples per Month *n*	
0.60	0.95	0.99	4.00	1.00


SLUDGE DRYING BEDS
AEROBIC DIGESTER NO. 2
AEROBIC DIGESTER NO. 1
EXISTING CONTROL BUILDING
INFLUENT
HEADWORKS
SECONDARY CLARIFIER NO. 1
CONTROL BUILDING U.V. DISINFECTION
SECONDARY CLARIFIER NO. 2
PLANT DRAIN PUMP STATION
OXIDATION DITCH
TOWN OF PE ELL
GENERAL SEWER PLAN AND FACILITIES PLAN AMENDMENT
PROPOSED W.W.T.P. PLAN
Gray & Osborne, Inc.
FIGURE 2-2



VICINITY MAP
NOT TO SCALE



LOCATION MAP

APPENDIX D--RESPONSE TO COMMENTS

No comments received.